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HYPHOLOMA AGGREGATUM AND H. DELINEATUM

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(WITH PLATE 12)

Since I published the notes on the *Hypoloma lacrimabundum* group of Agarics in Trans. Wis. Acad. Sci. Arts and Letters, Vol. XVIII, p. 412, Prof. Beardslee of Asheville, N. C., has sent me specimens and photographs of two of Peck's species, *Hypholoma aggregatum* and *Hypholoma delineatum*, with the suggestion that the former is the same as *Hypholoma Storea* var. *caespitosum*, Cke. As this species is what Maire and others consider the true *Hypholoma lacrimabundum* of Fries and is at least a fine addition to my *Hypholoma lacrimabundum* group and as these specimens of *Hypholoma delineatum* clear up a doubtful point in my article I will publish a few notes on the species and also the photographs with the kind consent of Prof. Beardslee.

1. The identity of *Hypholoma aggregatum* Pk. and *Hypholoma Storea* var. *caespitosum* Cke.

I have never collected *Hypholoma aggregatum* but a comparison of Beardslee's specimens with *Hypholoma aggregatum* in Shear's N. Y. Fun. No. 13 and with *Hypholoma Storea* var. *caespitosum* in Jaap's exsiccati No. 143 shows that there is at least a very close relationship between the two forms. Beardslee's photograph accompanying this article is also very similar to W. G. Smith's illustration of *Hypholoma Storea* in the Jour. Bot., Vol 14, tab. 176. The latter represents the plant since determined as *Hypholoma Storea* var. *caespitosum*.

The species belongs to what I have called the *Hypholoma lacri-*

mabundum group which now includes four or five well marked forms in the United States: the typical form illustrated in the Trans. Wis. Acad. Vol. XVII, pl. LXXVII, C, *Hypholoma echiniceps*, pl. LXXVIII, the present *H. Storea* var. *caespitosum*, the form called by Peck *H. aggregatum* var. *sericeum*, N. Y. State Mus. Bull. 54, p. 972, pl. 79, and the rugose form described as *H. delineatum*.

The characteristic mark of the group is the smooth purple-brown spores $3-5 \times 6-9 \mu$. Peck gives for *Hypholoma aggregatum* $3-5 \times 6-9 \mu$ and for var. *sericeum* $4 \times 7\frac{1}{2} \mu$. Beardslee's specimens agree with Peck's. Jaap gives for *Hypholoma Storea* var. *caespitosum* $4-4.5 \times 7.5-8 \mu$. Atkinson's measurements of the spores of *Hypholoma echiniceps* are $3.5-5 \times 7-9 \mu$. The spores of my specimens of this form agree, except that I found none over 8μ long. Typical *Hypholoma lacrimabundum* had spores $4-5 \times 7-8 \mu$ some of them shorter and broader, $5 \times 7 \mu$, and somewhat triangular, suggesting *Hypholoma populinum* Britz. as noted below. W. G. Smith says the spores of *Hypholoma Pseudostorea* are $2.5-3 \times 5-7 \mu$ and Plowright gives for *Hypholoma hypoxanthum* $4-5 \times 9-11 \mu$. These two species are considered synonyms of *Hypholoma Storea* var. *caespitosum* and show the extreme variations in the size of the spores provided that the reports of the measurements are accurate.

I have illustrated the spores of this group in pl. 12, C, which shows spores from typical *Hypholoma lacrimabundum*, *Hypholoma echiniceps* and *Hypholoma Storea* var. *caespitosum*. They are very different from the large tuberculate apiculate spores of all forms of the *Hypholoma velutinum* group which are shown in pl. 12, E.

All the forms in the group agree in their essential characters. The gills are dark, clouded, and with white, floccose edges. They are usually weeping, though scarcely at all so in *Hypholoma Storea* var. *caespitosum*. They become black with age. The surface of the pileus is innate fibrous and usually tears into tufts of fibers which are darker colored than the background. The stem is hollow and more or less scaly like the pileus. The gills are adnexed and the flesh is solid and whitish.

The forms differ in size, more or less caespitose habit, shade

of color and especially in the surface of the pileus. It is finely appressed-scaly in *Hypholoma lacrimabundum*, more coarsely squarrose in *H. echiniceps*, has fewer and larger patches of fibers in *H. Storea* var. *caespitosum*, is nearly smooth in *H. aggregatum* var. *sericeum*, and rugose in *H. delineatum*, if that species proves to belong to this group.

The variation in the group in Europe appears similar to that in this country. Plowright in the Trans. Brit. Myc. Soc. 1898, p. 45, considered *Hypholoma Storea* of Cooke's illustration 543 identical with *Hypholoma lacrimabundum* as illustrated in Fries' Icon. 134. W. G. Smith, however, in Jour. of Bot., 1903, p. 386, said that the gills of the former species do not weep and made it a new species *Hypholoma Pseudostorea*. He was followed by Rea in Trans. Brit. Myc. Soc., 1904, p. 65. Maire in the Bull. Soc. Myc. de France, 1911, pp. 41-42, supports Plowright's view and considers the weeping of the gills of little importance. Cooke did not admit that *Hypholoma lacrimabundum* and *Hypholoma Storea* var. *caespitosum* were the same species. If we compare the illustrations of Fries and Cooke with our plants and remember that Peck does not report the gills of *Hypholoma aggregatum* as weeping we conclude that about the same difference exists between the forms in the group in Europe as in this country. Some are larger and less caespitose with the pileus finely scaly and some are more densely caespitose with the pileus coarsely scaly. The former are typical *Hypholoma lacrimabundum* and the latter *Hypholoma Storea* var. *caespitosum* of Cke or *Hypholoma aggregatum* of Peck. A further hint of agreement between our forms in the group and those in Europe is the triangular shape of some of the spores in typical *Hypholoma lacrimabundum* which Maire has also noted and which he says is the only distinction between *Hypholoma lacrimabundum* and *Hypholoma populinum* Britz. The relation of species like *Hypholoma silvestre* Gill. and of *Hypholoma Storea* itself to the group needs further investigation.

The desirability of placing all the forms of the group together is evident. Peck's assignment of *Hypholoma aggregatum* to the section *Flocculosa* while *Hypholoma lacrimabundum* is placed in the section *Velutina* is most misleading. On the other hand, Maire's bunching all the forms together as one species loses sight of im-

portant distinctions which are of great use in comparing the floras of different countries and habitats and in understanding the variability of the groups. A proper arrangement should recognize the fact that plants exist in varying groups, each containing a multitude of forms due to many different causes and that the groups are separated by gaps which have arisen in various ways during the history of development.

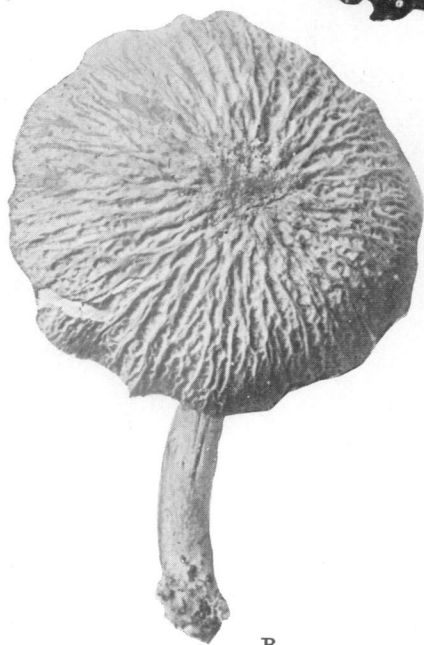
2. *Hypholoma delineatum* Pk. There appears to be no doubt that Beardslee's specimens, one of which is shown in pl. 12, B, are *Hypholoma delineatum* Pk. They are true species of *Hypholoma* with dark purple-black spores and fragments of the veil about the margin of the pileus. They confirm my opinion in note 2 on p. 413 of the article quoted above that the plant illustrated in Plate XXI is not a *Hypholoma* but probably belongs to the *Pholiota erebia* group and they also suggest that Peck's *Hypholoma delineatum* is a form of the *H. lacrimabundum* group. The spores are the same size and shape as those in the *H. lacrimabundum* group, Plate 12, C. They measure $4-5 \times 7-8 \mu$ in Beardslee's specimens; Peck gives $4-6 \times 8-10 \mu$. Peck placed the species after *H. rugocephalum* because the pileus was rugose wrinkled. Forms with rugose wrinkled pilei and similar in general appearance occur in several groups. There is one in the *Pholiota erebia* group illustrated in Trans. Wis. Acad., Vol. XVII, pl. LXXXIV, E. It occurs both in this country and in Europe; one in the *Hypholoma velutinum* group which Atkinson named *H. rugocephalum*, Trans. Wis. Acad., Vol. XVIII, pl. XX; and there is the typical form of the *Cortinarius corrugatus* group. The surface of the pileus in the last species is exactly like that of *H. delineatum* which Peck describes as "marked toward and on the margin even when dry with irregular radiating lines or ridges." But the color of the gills and the large tuberculate spores, $10-11 \times 12-14 \mu$, easily distinguish *Cortinarius corrugatus*.

Peck's description of *Hypholoma delineatum* is in the N. Y. State Mus. Bull. 150, pp. 83-84.

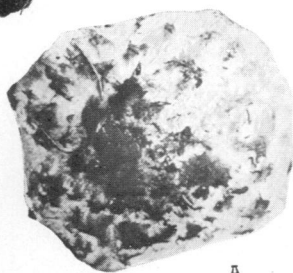
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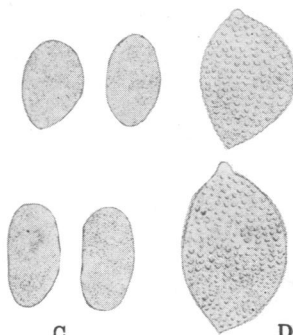
A



B



A



C

D

A. *HYPHOLOMA AGGREGATUM* PECK
 B. *HYPHOLOMA DELINEATUM* PECK
 C. SPORES OF *H. LACRIMABUNDUM* GROUP
 D. SPORES OF *H. VELUTINUM* GROUP